Program for Our

Monthly Physiotherapeutic Meeting

Monday, May 11th, 1925

A. L. YOCOM, JR., M. D., Chariton, Ia.

"Surgical Diathermy in the Treatment of Malignancies." A comprehensive discussion of various types of malignancies, together with practical demonstrations of the details of technic - - - - - - - - - - 10:30 to 12:30 M.

A. R. HOLLENDER, M. D., Chicago, Illinois

"Influence of Unusually Large Doses of Ultraviolet Radiations on the Nasal Membrane." - - - - - - - - - - - - - - 1:30 to 2:30 P. M.

MAURICE H. COTTLE, M. D., Chicago, Illinois

"Difficult Hearing; A Report of Some Recent Studies in Its Treatment." - - - - - - 2:30 to 3:30 P. M.

Physicians and surgeons are cordially invited to attend throughout the session or during those periods covering subjects in which they are especially interested.

In addition to the lectures, each speaker will be glad to answer any questions in connection with your own physiotherapeutic problems.

How to Get Here:

DRIVING—Follow Washington Blvd. west to Oakley Blvd., north on Oakley to Wabansia Ave., and one block west, or

BY ELEVATED — Take the Humboldt Park "L" to Western Avenue Station, walk one block north to Wabansia Avenue and a short block east to Claremont, or

BY SURFACE CAR—Western Avenue to Wabansia Avenue, and one block east to Claremont.

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FISCHER'S MAGAZINE

Fischer
CHICAGO, ILL.

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367

APRIL, 1925

TO REJOICE IN THE PROSPERITY OF ANOTHER IS TO PARTAKE OF IT.

—*WILLIAM AUSTIN*

Fischer's Magazine

Devoted to the advancement of the Science of Electro-Physio-Therapy and to the interests of those earnest and enlightened medical men who are practicing it.

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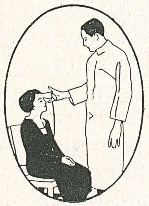
Vol. IV. April, 1925 No. 4

Prescribing Electricity

By J. U. GIESY, M. D., Salt Lake City, Utah



Medical electricity in whatever form available at the present moment becomes to the careful, thinking man a valuable agent in many of the cases presented to his attention. It becomes a thing to be deliberately and selectively used, in exactly the same way and with the same definite intention, that the medical man employs a certain drug. Medical electricity is a thing to be prescribed.

It is not a cure-all. It is not a fake. It is a deliberately selective means to an end. Let this ideal be erected in the minds of its users and then let it be preserved. Medical men should not give electrical treatments. They should prescribe electrical treatment and if equipped with the modality required to effect the desired end, they may administer their own prescription, by the aid of a technician, or if desired, it may be administered by themselves. This may seem an unnecessary distinction, yet it is far more consequential, not only in its effect upon the patient, but upon the medical man himself. There is, if one may use the term, a pharmacy of electricity as well as of drugs. Certain modalities produce certain physical reactions. They would be worse than useless if they did not. Hence it is the part of the user to learn these effects, how obtained, and in what need

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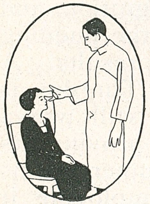

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What I wish, if—as the Englishman says—you know what I mean, is to get the users of electrical therapeutics, be they whatever type they may, to think! Let us approach the matter from the quiet, scientific standpoint, and not rush madly into unknown fields. Let us be ethical in this—that we use these new weapons of attack in an understanding fashion; that we use them so well that we establish them on a firm foundation of general recognition, and thereby become ethical indeed. The proof of the pudding is in the eating. Nothing speaks louder than results. A favorable result is an unassailable argument. The day is coming and coming fast when physiotherapy will win a general recognition, just because it is daily proving its worth. Calmly, quietly, and in a dignified manner, let us go forward, evaluating just what we have, employing it as scientifically as we may and as we ought without fear or favor, but with only one major end in view—the showing of benefit to those who need it by a calculated, understanding use of this newer means which is ours. Let us prescribe electricity in so intelligent a manner as to extend it far outside of any thought of contradiction and eventually prove our case, as prove it we will, since we are working with the TRUTH.

(From Jour. of Radiol., Feb., 1925)

Monthly Meeting, Monday, May 11th

You will find this a particularly interesting meeting, Doctor. Hear A. L. Yocom, Jr., M. D., discuss in detail the technic in treating malignant growths—with practical demonstrations.

See back cover page for full details

Sciatica

By MILES J. BREUER, M. D., Lincoln, Nebraska

The term, Sciatica, covers a multitude of clinical conditions differing in etiology, pathology, and treatment; it has a different meaning to every person that hears it. In discussing the applications of physiotherapy to this disease, the main part of the discussion must be taken up with diagnostic considerations; for a given technic may be very beneficial to one patient and fail utterly on another who apparently has exactly the same condition. The physiotherapist who considers technic only, will find himself blundering wildly and failing to get results most of the time; and will probably come to the conclusion that physiotherapy is not much good after all.

The reader is therefore advised to review the subject, after reading this sketch, in some standard text-book on neurology, such as Church and Petersen, or Jeliffe and White. If he does, he will find that these writers definitely recommend physiotherapeutic methods in their sections on the treatment of this condition.

We may first broadly divide sciatica into two portions: sciatic neuralgia, and sciatic neuritis. Theoretically there is no difference except in degree; but in cases termed neuralgia, the inflammation of nerve structures is so slight that pain is the only symptom. In the neuritis conditions, there will also be other physical findings of impaired nerve function. I will list them in the order of severity; the more severe the inflammation, the further down the list will the findings occur:

"Pressure points" of extreme tenderness, usually as follows: the sacro-iliac joint; the sciatic notch; and the head of the peroneus muscle.

Hyperesthesia of skin areas over the outer and posterior aspects of the leg and thigh.

Motor deficiency in muscles supplied by the sciatic nerve, which are the extensors of the leg and foot; the patient is unable to rise on his toes, drags his feet as he walks, and has diminished or absent reflexes, including the patellar, plantar, and Achilles.

It would seem unnecessary to state that sciatica must be differentiated from sacro-iliac arthritis and from disease of the hip joint, were it not for the fact that the error is made frequently enough. Putting the sciatic nerve on a stretch by flexing the thigh and extending the leg will always produce pain in a sciatica; in hip joint disease, any movement of the hip joint (meaning an actual change in relative positions of femur and pelvis) will produce pain. Sacro-iliac arthritis may co-exist as the primary condition with a sciatica.

Let us first consider the functional sciaticas, in which it is absolutely useless to tinker locally with the sciatic nerve. Anemic conditions are a frequent etiology; in such cases treating the original cause eventually relieves the sciatic pain. Look for pernicious anemia, nephritis, endocrine disorders, malaria, syphilis, and intestinal parasites. Diathermy sometimes gives temporary relief; use a tin electrode over the sciatic notch and a cuff around the leg. Negative galvanism by the same method may also serve palliatively.

This temporary palliation is not even possible in another class of sciaticas, the reflex group. This is sometimes a very puzzling condition, and very frequently it defies all of our efforts at relief as well as at finding a cause. Diseases of the heart, lung, stomach, liver, kidney, ureter, bladder, intestine, uterus, ovaries, prostate, or testicles, may produce reflex pain in the sciatic nerve. The reader who is familiar with the mechanism of the production of Head's zones will understand this point, if he will in addition consider that these zones may overlap to a great extent by means of intercalated neurones. Even in these cases, it is worth while trying for palliative results with diathermy, high frequency sparks, or galvanism, and even actinic light reactions, upon the principle of counter-irritation. In considering this particular group, always think

of chronic constipation, which is a very frequent cause of sciatica.

Finally, as our last functional group, we have the sciaticas brought on by psychic and emotional causes. Many of these respond quite readily to physiotherapeutic methods, as might naturally be expected. These are the cases that leave their crutches at the shrines of all kinds of bunk healers. Yet, they are a very real problem in the hands of the physician; a problem to diagnose, and a problem to treat.

Now for conditions in which there is anatomical inflammation in the nerve. Arteriosclerosis is one of our frequent causes; the interference of blood supply to a nerve has very painful results, and is produced either by restriction of blood volume coming from larger vessels to the nerve; or by actual endarteritis of the endoneural artery. The relaxing effect of diathermy, with its augmented mobilization of blood is always beneficial in this condition.

Probably the vast majority of cases of sciatica are due to the direct action of toxins on the nerve tissue. We have the following groups of toxins: metals, as lead, arsenic, mercury, and copper; organic poisons, alcohol, tobacco, carbon monoxide; infections, as tonsillitis, typhoid fever, measles, gonorrhea, influenza, syphilis, and streptococcus; also fatigue and exposure to cold. Here, again, is an excellent opportunity to do a great deal of good by physiotherapeutic methods. Diathermy, with its increased blood supply, bringing reinforcements of leucocytes, opsonins, and other substances for biological defense, and increased nutrition, is the choice of all methods of treatment, physiotherapeutic or otherwise; the only thing at all of equal importance with it, is the eradication of the source of the toxin and the elimination of what toxin remains in the body. A block tin plate over the sciatic notch, and a half cuff around the leg below the lowest point of the pain is the technic; and as heavy a current should be given as the skin will stand. Take good care of the skin; if that is burned the treatment is interrupted, for the area of application is limited. During the acute stages, the limb should be kept as nearly immobilized as is practically feasible. Negative galvanism is the second choice for treatment, but is very effective. A battery must be used; a mechanical source, because of the unsteadiness of the current is so painful and irritating that currents of sufficient strength to do any good cannot be used. Hydrotherapy, especially with hot packs, is also of limited application. In sciatic inflammations due to infection, salicylates should be used; the intravenous route being preferable as not interfering with appetite and digestion. Iodides, intravenously, should be used in all inflammatory cases.

In chronic cases, a great deal of patience is necessary; nerve tissue recovers very slowly. In case of severe nerve inflammation, where the nerve is destroyed, the nerve must regenerate from the nerve-cell body in the anterior horn, which requires from three to nine months. If reactions of degeneration appear, indicating that this has taken place, it is necessary to keep up the nutrition of the muscles in the interim by stimulating at the motor points with galvanic make-and-break shocks; for this a mechanical current source is excellently adapted.

Coming—The October Physiotherapy Meeting

Elaborate plans are already being laid for the big Physiotherapy Convention next fall. A long list of prominent physicians and surgeons will talk on subjects with which they are wholly familiar in everyday practise. Elaborate clinics and round table discussions will be a feature. It will be a meeting from which the practising physician may take home with him a wonderful fund of sound, up-to-the minute information for use in his own practise. Plan *now* for that week in Chicago, Doctor—it will be infinitely well worth while.

Watch for Further Announcements

Diathermy in the Treatment of Gonorrhoea

By **WILLIAM S. EHRICH, M. D., F. A. C. S.,**
Evansville, Indiana

The only really original device used in this work is the penis electrode. The experimental work was done with a double wrist electrode which was twisted into a shape approaching that desired. The tension of the spring is adjusted so as to slightly embarrass the circulation as well as to hold the penis firmly.

For the prostatic urethra we use the Monae-Lesser rectal electrode and for the perineum a simple cylinder or disc. With both of these is used a large lead foil opposite the electrode, placed on the abdomen in prostatic work and the sacrum in perineal.

The source of current may be any of the high frequency machines that will deliver 1500 milliamperes of smooth current.

In the penile application it takes about 900 to 1000 ma. to bring the temperature up to 110 degrees (108 degrees has been found to kill the gonococcus instantly) and then reduce the current to between 800 and 900 ma., which holds it well above 108 degrees for about 15 minutes. We do not pay as much attention to the meter as we do to the thermometer since the thickness of the organ and other elements cause a difference in resistance which requires more or less current to obtain the same amount of heat. We use the ordinary rectal thermometer inserted into the urethra.

In acute gonorrhea the results at times have been startling. In the beginning of our work we found that there were recurrences in several cases. We then extended the time of the exposure and found that by using 110 degrees for 30 to 40 minutes sterilization was accomplished. The external parts were very carefully sterilized with alcohol and cyanide of mercury to prevent reinfection. It is not at all uncommon to see a case which shows a heavy purulent discharge, which is laden with gonococci, after 24 hours change to a mucous discharge in which leucocytes, some epithelial cells, but no gonococci are present. In these cases we always give a few more exposures to insure against any organism which might still have enough vitality to give trouble. A mild, slightly astringent lotion will take care of the remaining inflammation, which, however, may persist for several weeks.

As representative of this type we report the following case:

S. F., age 28. Occupation, clerical work. Complaint, urethral discharge of one day's duration; first infection. Examination revealed a purulent discharge laden with Gram negative diplococci. First urine cloudy, second clear. Exposed to 110 degrees for 40 minutes. Following day showed a heavy mucous discharge containing no gonococci. Again exposed for 30 minutes to 110 degrees. Fourth day showed a very slight mucous discharge. Exposed to 110 degrees for 30 minutes. Sixth day both urines clear with a few mucous shreds in first. We believe that it is in this stage of the disease that diathermy will accomplish the most good.

In subacute stage as in the chronic the treatment is more difficult. Not only is the penile electrode used but heat is applied to the bulbous urethra by means of the electrode on the perineum with a large pad over the sacrum or lower abdomen. Should there be any evidence of prostatic infection that portion of the tract is also heated.

W. F. reported May 22nd. Suffering from acute gonorrhea. He was treated until July 5th with injections of lunosol alternating with mercurophen, internal urinary antiseptics, etc. At this time both urines were cloudy and there was considerable mucopurulent discharge containing large numbers of gonococci. After four exposures to heat there was still a mucous discharge with some pus cells but no organisms. The prostate was then massaged and the vesicles were stripped and a large amount of secretion expressed. This was repeated three times and the patient dicharged August 10th, apparently normal.

Those cases in the chronic stage take longer to treat but the results seem to justify the procedure. The reason probably that we have not gotten quicker results was that we had to feel our way in applying heat to the rectal mucosa since we had no desire to burn this tissue and consequently, I feel sure, did not apply sufficient heat nor did we give enough time to the exposure to get the best effect. Right here I want to mention that diathermy alone will not cure all cases of urethritis even though the patient may be sterilized of the gonococcus. The secondary lesions such as infiltrations, prostatic pathology, etc., must be given appropriate and sufficient treatment.

L. W. reported for treatment October 9, 1923, suffering from a gonorrhea of over a year's duration. There was a slight discharge containing Gram negative diplococci as well as staphylococci and a Gram positive diplococcus. Every conceivable method of treatment was used to clear up this infection, which invariably returned a few days after treatment was discontinued. He was heated six times when the discharge ceased and the urine began to clear of shreds. After six more treatments there is only a very small light shred in a perfectly clear urine. Centrifugal specimens of the urine show an occasional leucocyte but no organisms. This patient has not been treated during the last three weeks but is required to report once weekly for examination, which has always been negative.

In epididymitis our results coincide with those of Dr. Corbus, which were recently published in the Journal of Urology. All pain is relieved by the first treatment and after two or three the scrotal contents become normal. There seems to be much less permanent enlargement of the poles than after any other treatment.

Y. H., suffering from a subacute gonorrhea, developed an epididymitis and when he entered our service the organ was about twice the normal size and painful in the extreme.

He had used hot applications and all the other orthodox remedies. The first application of diathermy relieved his pain to the extent that he was able to go to his office and after the fourth treatment he was practically normal so far as his epididymitis was concerned.

Some cases take a longer time to sterilize than others under similar conditions. So far we have failed to find the reason. It is interesting, however, to observe the smears in cases of mixed infections where after a few heatings the gonococcus disappears, leaving the other organisms, which are more resistant to heat.

There is always a discharge of mucous for some time after the case is sterilized and I suspect it is due to the oversecretion of the glands caused by the stimulation from the heat.

We have found that it takes a shorter time to recover if we use a very mild injection of some of the organic silver salts accompanying the heat. It would seem that this takes care of any organisms which may have been outside of the zone of intensity of the heat and have been stunned rather than killed by it.

None of our cases have suffered from cordee or any other pain after the first treatment.

In closing I wish to express my thanks to Dr. Minor Miller of the U. S. P. H. Service for his assistance in this work.

(Reprinted from Urol. and Cut. Rev., Nov., 1924)

An Interesting Meeting and Clinic for Physicians and Surgeons

Members of the Medical Profession who are interested in Diathermy will find the next regular Monthly Meeting and Clinic at 2335 Wabansia Avenue, Chicago, on Monday, May 11th, of special interest. Well-known speakers—actual demonstrations.

See Back Cover for Program

Uterine Subinvolution

By J. U. GIESY, M. D., Salt Lake City, Utah

In my last article I spoke of the treatment of Uterine Fibromata by the use of the galvanic current. In this I want to take up another condition of the female pelvic organs, which is very common, and apt to prove more or less unsatisfactory in its treatment by ordinary methods, yet one which when properly attacked by galvanism will respond readily and in a surprisingly short time.

I refer to the condition known as subinvolution, with or without resulting displacement of the organ. Because regardless of displacement either one or both conditions can be relieved, unless the uterus is actually bound down in its abnormal position. This is a statement I have proved.

In subinvolution, two things are mainly to be considered. And galvanism applies directly to each. In the first place the organ is enlarged, due to a relaxed condition of its musculature. The muscle is flabby, the organ boggy and lacking in all tone. I have seen them as flaccid as an old glove. Secondly, the circulation is disturbed, there is a passive state of the blood stream—a stagnation or partial stasis, which is exactly what one would expect in a condition where the muscle condition has robbed the circulatory channels of its normal support.

Remember what I have said about the galvanic current. It is unidirectional, with a definite polarity, each pole being capable of producing constantly similar effects. Now—recall the action of the positive pole. It is haemostatic, it contracts blood vessels. It allays irritation, checks inflammation, hardens and contracts tissues. You have a relaxed organ with flabby walls, a lack of tone in muscle, a lack of tone in blood vessels, a disturbed circulation. This organ needs toning up. How shall it be brought about? Let's try it the way I've been doing it for years.

Place your indifferent electrode (the negative in this case) over the abdomen, or if you prefer, the lumbar back. Use a speculum to expose the uterine os. Take the active (positive) pole and let it be either a slender silver, ball tipped wire electrode, or a small copper intra-uterine electrode. Insert it gently. If it doesn't go in readily, though it usually will, turn on ten milliamperes of negative current, by using your pole changer—until it does. Once it is in place give ten, twenty, thirty milliamperes positive to the intra-uterine canal for twenty minutes. Regulate the current to your patient's comfort at first. They'll take more later as they get used to it. After the treatment, slip out the sound. It may stick. If you are using a copper sound, it almost certainly will, but a slow, gentle traction will bring it out. A few drops of blood may come with it. No matter. After a few treatments this will stop. And here is what will happen. This uterus will contract, grow smaller, approach normal measurements from day to day. It will gain tone. And as it does this if displaced it will gradually come back to position unless otherwise affected by some past trauma, which has resulted in distortion rather than displacement. If you don't believe this, try it for yourselves.

This is the simplest technic. We may vary it. If you have a machine giving you both galvanic and sine currents, it is a good thing and one which will quicken results, to administer a slow sine wave to the uterus, after the direct positive has been shut off. Leave your uterine pole in place. Switch your indifferent pad to the back or if using this technic, place it there first. Then for say ten minutes, give this slow sine, and stop. By the addition of this modality to the galvanic current, you get not only the chemical effect of the positive polarity, but the added advantage to both muscle and circulation of an actual passive motion, a cellular massage. This aids return to tone very greatly, though either technic has given splendid results in my experience. Try it. You'll be gratified and your patients will be pleased. It's really amazing how many women are carrying around a subinvoluted uterus, and I do not hesitate to say that every woman should be checked up post partum to see that such a condition does not exist. If we don't check them up we are not doing our full duty to our patients.

New Schedule of Waggoner Physiotherapeutic Clinics and Lecture Courses

By Mel R. Waggoner, M. D.
Cedar Rapids, Iowa

Doctors who are keeping pace with the development of physiotherapy will find these lectures and clinics a most valuable source of new information and up-to-date practices.

Classes for the Coming Season Follow:

Memphis, Tennessee	(Chisca Hotel)	**April 6th to 11th**
New Orleans, Louisiana	(Roosevelt Hotel)	**April 13th to 18th**
Dallas, Texas	(Adolphus Hotel)	**April 20th to 25th**
Monroe, Louisiana	(Hotel Monroe)	**April 27th to May 2nd**
Indianapolis, Indiana	(Claypool Hotel)	**May 11th to 16th**
Detroit, Michigan	(Wolverine Hotel)	**May 18th to 23rd**
Pittsburgh, Pennsylvania	(Wm. Penn Hotel)	**May 25th to 30th**

Personally conducted Clinics, Courses, Lectures

For Full Information as to Detail of Courses, Fee, etc., Write the Secretary of the Waggoner Lecture Courses, at

1664 North Claremont Avenue
Chicago, Illinois

A Method for Diathermy to the Middle Ear

By MILES J. BREUER, M. D., Lincoln, Nebraska

At the Physiotherapeutic meeting last fall, there was a great deal of favorable comment upon the beneficial effects of diathermy on chronic middle ear inflammation with deafness and tinnitus. On the whole, various workers seemed to agree that in many cases, when the treatment was continued long enough, marked improvement in symptoms was noted. But, there was a great deal of discussion as to the method of applying this treatment, and a great deal of disagreement on this point. Some were using metal wire wrapped with moistened cotton and inserted into the external canal; others used the fingers of the patient, with electrodes held in the hands.

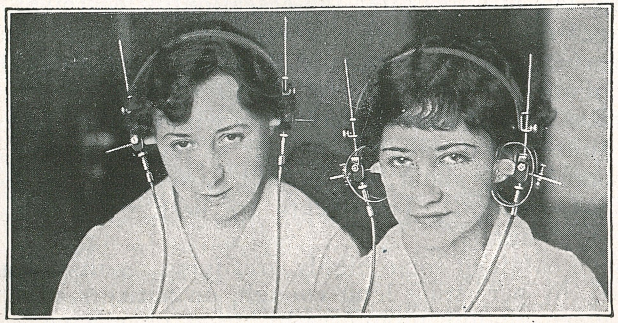
Both of these methods have their objections. The little finger is a poor conductor, as it consists mainly of bone; and half of its contact surface with the skin of the ear canal, is finger-nail, which is no conductor at all. There is an unpleasant heating before a sufficient amount of current can be passed to have a desirable effect on the middle ear. The wet cotton method, I think personally, is a very bad procedure; wet electrodes should never be used in applying diathermy. As they become warm, evaporation takes place, resistance is increased, and burns may result, either from steam, or from high local resistance; in any event, the current constantly decreases in volume during the treatment.

It occurred to me that if this treatment is given at all, it must be given over a long time; and therefore it would pay to make special electrodes to fit the ears of each patient, and thereby obtain accurate metal-to-skin contact over a large area of the auditory meatus. The following technic was devised; it is not difficult to carry out for anyone who has ordinary everyday laboratory or mechanical ability.

Soften a piece of paraffin wax as big as the end of your finger in warm water (or, I used an ordinary bacteriological incubator which we have in the laboratory). Mold this roughly into the form which will fit the external meatus, and then force it into the patient's ear canal, using a good deal of pressure, so that an accurate cast of the canal is obtained. Allow it to remain for a few minutes, whereupon it will harden sufficiently so that it can be removed without distorting its shape. Harden further in cold water.

From this, a plaster-of-Paris mould is made. Get your dentist friend to show you how to mix the plaster properly; in this day of prepared plaster bandages, physicians have lost the art of working plaster. Fill a small pasteboard box, such as is used for powders or pills, with plaster of such a consistency that it will just barely flow out of one vessel into another. Force the paraffin casts into it, smaller end downward, and leave for a half an hour to solidify. When the plaster has become solid, the paraffin cast is readily pulled out. The plaster mould must be allowed to dry thoroughly, which process is hastened by leaving it over night in a warm place (I use my 50 deg. incubator, which we have for paraffin embedding of tissues).

The next day, melt up a piece of block tin in an old tablespoon, over a gas stove or a bunsen burner or a blow-torch, and pour into the mould. Before it solidifies,



Special headsets for diathermy treatments.

insert a wire, the end of which has previously been tinned with solder, i. e., apply soldering paste or zinc chloride solution, heat the wire, and rub it on a piece of solder until the end is bright and shiny with melted solder. Hold this wire in place, vertically, until the tin has solidified; it then forms a handle by which the electrode is clamped in position, and to which the connecting cords can be fastened. When cool, the electrode is removed, and smoothed off with a piece of steel wool.

For the treatment, the electrode is lathered with soap, in the same manner as other block tin electrodes, and inserted into the ear. It is best held in place by one of the "head sets" devised for this purpose, similar to radio telephone head sets; I obtained mine from the Fischer Company.

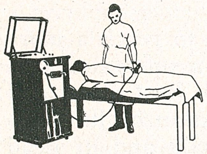
For some time, I heeded warnings that I had heard, and treated only one ear at a time to begin with, lest some damage be done, by the treatment. But, I have never seen any damage done, and cannot conceive how any could be done; and now I am letting them have it in both ears at once; the diathermy is passed straight through the head between the two ears. The only effect I have ever noted from it in an unfavorable sense, was a vertigo, which passed off in a few minutes after the cessation of treatment.

Currents must be small; I have occasionally given as much as 200 m.a., but usually it is a fraction of that. A small diathermy apparatus is required, or the step-down apparatus may be used in connection with the larger models. It is quite safe to give the patient as much current as he can comfortably stand; but do not permit it to cause any burning sensation. Treatments are best given daily, for 20 to 30 minutes.

I have obtained some highly gratifying results with this method, by persisting long enough, on patients who have been given gloomy prognoses by other physicians.

Physiotherapy in Pulmonary Tuberculosis

By MILES J. BREUER, M.D., Lincoln, Nebraska



Tuberculosis is the chronic disease *par excellence*. The bacillus grows slowly; where you can raise a rich culture of another organism over night, the tubercle bacillus requires three months to produce a visible growth; where a lesion due to another organism will develop and heal within days or weeks, tuberculous lesions require months and years to develop. From the time that the lesion in the apex begins as a mere microscopic speck until the time when it is developed so plainly that you can diagnose it across the street, years elapse during which there is pathology present, which can be diagnosed by the man who knows how.

Here is where the physiotherapist can get in his effective work. If he can recognize the pulmonary lesion early, when it consists of an area of infiltration with lymph and small-round-cells, he can do wonders with it, because he has very powerful means at his disposal for handling it. The diagnosis of tuberculosis at this stage has been vastly refined and perfected during late years.

For increasing the circulation of blood in this area, diathermy stands out as the main method. A fresh, active rapidly moving supply of blood is the only real "specific" for tuberculosis; and this can be secured with diathermy, which dilates the capillaries in the particular spot that is being treated, and nowhere else. The high degree of heat produced is unfavorable to the existence of the tubercle bacillus, and is very favorable to the biochemical processes that the body undertakes in order to repel the invaders. We are producing locally the high temperature, which Nature in her efforts to fight the infection, is compelled to produce in the whole body. A close second of diathermy is the infra-red light, whose effects are very similar. The effects of galvanic and sinusoidal currents are less widely known, but there is much evidence to support the idea that they can stimulate constructive metabolism. The surging sinusoidal wave can certainly stimulate the movements of the affected portion, and promote blood, lymph, and air circulation. Mechanical vibration, with the proper technique, by stimulating nerve cell bodies, can do a great deal in the same direction.

However, if the disease has been permitted to reach a more advanced stage, the story is very different. The infiltrated area has become so large that its center cannot be kept alive, and breaks down. There is necrosis, with destruction of lung tissue; there is a very large mass of active bacilli and of dead protein material and accumulated toxic products of bacterial action. If we begin stirring this about, and sending increased amounts of blood through it, we produce an extensive increase in the absorption of toxic materials and flood the body with them. Lack of caution in the treatment of advanced cases with physical means often makes them worse, and permanently alters the prognosis. With the increased metabolism brought about by heat and extra circulation, the first thing that happens will be more tissue destruction; and if a blood-vessel happens to lie in the path of this, the result might be a serious hemorrhage. In an advanced case, while the indications are much the same, they must be carried out with extreme caution. A severely diseased part needs rest rather than exercise or movement, and sedative rather than stimulative measures. The increased nutrition provided by diathermy and infra-red light is just as valuable here, but must be applied very gradually and carefully.

The above is a brief statement of the general principles underlying the treatment by physical methods of the primary pathology in pulmonary tuberculosis. In addition, it is necessary to consider secondary and associated pathology. Among the latter, the most important is the restriction of abdominal movement, with its tremendous train of consequences. Just as the abdomen is rigid over a peritonitis, or the muscles are rigid about an inflamed joint, so there is a spasm of the muscles whose nerve supply comes from the spinal segments which receive the afferent impulses from the lungs. These are the muscles of the shoulder-girdle, the diaphragm, and the muscles of the abdominal wall. The maintenance of the abdominal circulation depends on the mechanical movements of the contents caused by the action of the diaphragm and the abdominal wall. When this movement is restricted, the resulting vascular stasis affects practically every organ in the abdomen. That is why the tuberculous patient is such a terrible bunch of symptoms; that is why he doesn't eat, and is constipated, and has low blood pressure and poor elimination through bowels and kidneys, and tympanites and hemorrhoids, and abdominal or epigastric pains, with the addition of pelvic symptoms in women.

For the relief of the underlying condition, we have the sinusoidal wave to supply movement to the abdominal contents and tone to its muscles, for which the respiratory rate is appropriate; and for the relief of the intestinal atony, the intestinal rate is better suited. To assist in the elimination of toxins, autocondensation, preceded by copious draughts of water; hydrotherapy, to open the pores and stimulate peripheral circulation. For stimulating a rise of blood pressure, high-frequency sparks or vibration along the spine and over the solar plexus are effective, and will contribute markedly to the patient's feeling of well-being.

Sinus affections are frequently associated with pulmonary tuberculosis. Their treatment also may derive material aid from physiotherapy, but is of a specialized nature that is out of place in this discussion. The same may be said of hemorrhoids.

In this disease, as in many others, the necessity of treating symptoms frequently arises. The most frequent of these is pain, usually in the chest or back. Vibration, high-frequency sparks, high-frequency discharge, radiant heat and light, negative galvanism, and diathermy, are all useful, on the principle of counter-irritation. No rule can be set down as to which is most applicable in a given case. The dry reflex cough is also often troublesome, and will in most cases yield to the above measures, generally on the principle of counter-irritation. Headache, if toxic, calls for elimination by autocondensation and deep radiant heat and light; tympanites will yield to the sinusoidal wave and to vibration.

Bear in mind that one of the chief values of physiotherapy in tuberculosis is that it presents to the untrained eye, the external evidence of something being actually done for the patient. The old routine treatment of tuberculosis looks to the layman too much like doing nothing; and there is no detrimental factor so potent in delaying recovery as discouragement. Even if physiotherapy accomplished little that is fundamentally different in a material way from the results of the old methods (though I am by no means ready to admit that), still, the hope with which the patient becomes filled when he sees that something is being done for him and with him, is in many cases the deciding factor which swings a dubious prognosis from the dark side to the bright.

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Diathermy to the Heart

By GUSTAV KOLISCHER, M. D.

Chicago, Ill.

The heart is the most important organ in the regulation of the blood supply. Shooting pains, fainting spells and all these symptoms are due to an insufficient blood supply of the heart. The nerve centers that regulate the heart action are located between the ventricles and the auricles. If on account of the calcification of the coronary arteries the blood supply of the nerve centers located between the ventricles and the auricles becomes lower, then an attack will occur because the nerve centers are reduced in blood supply.

If heat produced by a high frequently current is applied, the femoral arteries become dilated and the patient will get over the attack. This dilatation will persist for quite a while after the treatment but after a while the treatment must be repeated. While it is not a cure—we cannot change the arteries—we relieve the patient for a long time of all these dangerous symptoms. The arteries of the heart are dilated so it is important not to overdo this treatment. We follow these rules: In the first place any time that either the abdominal or pectoral cavity is treated the diameter of the electrodes should correspond with the depth of the chest or belly. The sphere put on the chest and back should have the same diameter as the chest from the front to the back. Place the electrodes over the heart and begin slowly with the current and never raise it beyond 100 ma. One gets all the good results with no excessive amount of the current. The proof of this is that after the treatment is over the patient will say he feels fine. If it is overdone the heart is over-stimulated and the patient will become restless and produce a cold perspiration.

These treatments should not be given oftener than twice a week. Test your patient in each case. If you have to deal with a nervous individual go slowly, with a robust individual you can go faster. The main thing is not to do too much. It is remarkable what can be accomplished in these cases.

(Reprinted from Journal of Radiology)

The High Frequency Current

By ALBERT C. GEYSER M. D.

New York City

Of all the electric modalities so far invented for therapeutic purposes the high frequency current is the most interesting. This is so because this current produces absolutely nothing but results which are in harmony with the laws of physiology. Its name is derived from the fact that its alternations mount up into the million per second, just stop to ponder for a moment, "one million alternations per second". That is some speed, yet, is it any real speed as perhaps compared to the speed with which the individual ions move throughout this universe? The scope of this paper does not permit of further speculation.

We recall that the galvanic current caused electrolysis whenever it was passed through a decomposable substance including the human tissues. To separate ions (electrolysis) requires only 1/60,000 part of a second. If during this short space of time the galvanic current is applied to living tissue, it causes tissue decomposition. If attempts at tissue contraction follow each other at greater frequencies than 5000 per second, the tissues are unable to respond and they remain flaccid.

From this we may reason that the high frequency current with 1,000,000 alternations per second cannot cause electrolysis; neither can it produce tissue contraction. Since the high frequency current flows in one direction for only 1/1,000,000 part of a second it causes a stress or strain to be set up within each atom whereby the corpuscles and the ions are pulled apart, then forcibly driven together again. Because of this inter-ionic friction thus produced, according to the laws of physics "All arrested motion results in heat." This is one of many reasons why electrolysis does not take place in tissue when the high frequency current is passed.

Tissue contraction and relaxation require time, at least 1/5000 part of a second. When the impulses exceed this time, the tissue not only fails to be influenced by it, but is affected in the other extreme, it becomes completely relaxed, flaccid. These two qualities furnish us with the cue as to the therapeutic possibilities; development of internal heat through interionic friction and complete relaxation or flaccidity. Both of these factors are physiological necessities at all times, but especially so during disease processes, acute or chronic.

What disease process is not accompanied or even maintained by capillary spasm, stasis, congestion or anemia?

The principal tissue metamorphosis takes place in the capillaries. If the capillaries are in a state of spasm neither oxidation nor diapedesis can occur; without these, recovery is impossible.

Pain, in every instance, is due to one of two or both conditions, pressure or irritation.

Spasm, muscular or capillary, is pressure, toxic association with sensory nerve cells means irritation. Interionic friction will assist nerve cells in dissociating toxins, flaccidity or capillary dilatation favors diapedesis, leucocytosis and oxidation. Neither the high frequency current nor any other therapeutic modality should be employed with the object of curing a disease.

All modalities are therapeutically indicated as they are capable of calling into action *physiological responses* with the *least damage* to the rest of the general economy.

While the galvanic, faradic and "sinusoidal" current have their specific indications, the high frequency current is almost universal in its applicability.

The high frequency current is used therapeutically in two forms, the autocondensation and the diathermia method.

Whenever possible it is well to employ a special apparatus for special work.

The auto-condensation method requires an auto-condensation chair, couch or other device suitable for the purpose.

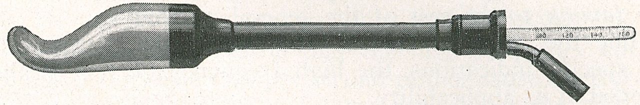
The patient is connected to one pole of the machine while the other pole is attached to a large sheet of metal over which is placed either hard rubber, fiber or a hair mattress in such a manner that the patient's body cannot come into direct metallic contact with this pole. Since the patient is connected directly to only one pole of the machine, the current is obliged to pass through the insulating material before it can saturate the patient. To make this possible we require a current of comparatively high voltage such as is given here.

Such a current is known as a current with high voltage and damped oscillations. When the patient is connected to one pole of such a current, the entire body acts as a capacity while the large metal sheet represents another capacity. Since these two capacities, the patient's body and the sheet of metal, are separated by a non-conductor, a stress or strain is set up in each of them. This stress "irritates" the ionic equilibrim, causing heating of the entire body with increased oxidation, increased metabolism, and increased output of urea.

These physiological results are indicated in every disease where general constitutional effects are desirable. In cardiorenal disease where high-blood pressure is a marked symptom this current is a real physiological specific.

(*From Am. Physician, Jan., 1925*)

The New Small Size Chapman Vaginal Electrode



To meet the need, which the physician occasionally encounters, for a smaller vaginal electrode, we are now supplying the Chapman Vaginal Electrode in a new small size. The shank is $\frac{15}{16}$-in. in diameter, the cervical bowl is $1\frac{7}{16}$-in. wide and $\frac{5}{16}$-in. thick. Handle is of hard rubber. Price, complete with thermometer, $12.00; electrode only, without thermometer, $6.50.

The Regulation Size Chapman Vaginal Electrode is supplied with shank $1\frac{3}{16}$ inches in diameter, and with cervical bowl $1\frac{3}{4}$ inches wide and $\frac{3}{8}$ inch thick. Handle of hard rubber. Price, complete with thermometer, $12.00; without thermometer, $6.50.

H. G. FISCHER & COMPANY, Inc.
2335 Wabansia Ave., Chicago, Ill.

Diathermy In Knee Joint Injuries

By CHARLES R. BROOKE, M. D.

Chief, Physiotherapy Clinic, U. S. Veterans' Bureau
New York City

The cross-fire method of diathermizing joints is used by the writer with justifying success, this being found to be of particular value in knee joint injuries. The exact technique of the method is carried out by the sequence of four different applications of the electrodes as follows:

The first treatment is given by the cuff method, cuff electrodes being placed around the leg just below the patella ligament and around the thigh just above the knee joint. The second application is carried out by placing plate electrodes above and below the knee diagonally opposite each other. The third treatment is given by reversing the electrodes, and in the fourth and last application, the electrodes are placed one over the knee cap and the other in the popliteal space. Duration of each application and treatment is twenty minutes, given singly or combined and repeated as often as indicated.

It must always be remembered, in the application of electrodes for diathermy, that the smaller active electrode is placed over the site of greatest disability with the larger or inactive electrode diametrically opposite. This plan brings the involved area between them always with their edges far enough apart to prevent arcing of current between the electrodes. Diathermy should be followed by either massage and exercise, sinusoidal wave, rhythmic faradism or the combination of static wave, sparks and brush discharge. The combination of diathermy with any of the above modalities hastens absorption, decongests the tissues, relieves pain and promotes a physiological reaction which hastens the return of tissues to normal condition and the joints to normal function. The duration of treatment may range from twenty to thirty minutes up to tolerance of the host. Diathermy is contraindicated where there is walled-in pus, liability to hemorrhage, acute tuberculous disease of bones and joints, malignancy and improperly reduced fractures and dislocations.

(*Reprinted from The American Journal of Physical Therapy September, 1924*)

Treatment of Gonococcal Vesiculitis by Diathermia

By DOCTEUR M. E. ROUCAYROL
Paris, France

The invasion of the seminal vesicle is a frequent occurrence in the course of a blenorrhagia, either spontaneously, or as a result of badly performed injections or lavages.

The acute stage, with painful symptoms and polyuria, is only transitory. It often gives the appearance of yielding to mild medical treatment, but in reality the gonococcus subsists in the vesicle. If at times it indicates its presence by a "drop," or by a more or less cloudy urine, there are, on the other hand, cases where only the presence of a gonococcal infection in the woman leads us to make a spermoculture of the husband, which gives us the solution to the problem.

I have treated by my method of diathermia a certain number of cases of vesiculitis which have resisted other measures. It is necessary to heat for 20 minutes to a temperature of 45 degrees C. If the patient bears the urethral electrode badly, on account of its making him want to urinate, recourse can be had to a rectal electrode, which is very well tolerated in all cases.

I give here some specimen case-reports of patients who had either vesicular lesions perceptible to the touch, or simply gonococci in the spermocultures:

Case 1. 106/24. Man, aged 28. Patient treated in 1920 for chronic urethritis, by dilatation. At that period examination of the sediment of centrifuged urine gave negative results. In 1924 the patient, wishing to marry, returned to ask advice. On examination, the urethra was found to be sound, and the urine absolutely clear, with no trace of pus. Spermocultures gave gonococcus positive.

Treatment: 8 daily seances of diathermia at 45 deg. Spermoculture negative.

Case 2. L95/24. Male, aged 30. Patient of Dr. Mourlon. Treating his wife for a gonococcal metritis, I examined him and could find no urethral lesion; urine clear and without pus; no urinary history. Spermoculture, gonococcus positive.

Treatment: 4 diathermias of 20 minutes at 45 deg. Spermoculture negative.

Case 3. PM61/23. Male, aged 30. Acute vesiculitis, with terminal hematuria. Gonococcus in the discharge.

Treatment: 7 diathermias of 20 minutes at 45 deg. No more "drop." Urine clear. Spermoculture negative.

Case 4. D79/24. Male, aged 26. Infection dating back 5 years. Gonococcal prostato-urethro-vesiculitis. Formerly treated by vaccines, and dilatations.

Treatment: 5 diathermias. Urine clear, without pus. Spermoculture negative.

Diathermia, then, may be of service and is justified in an affection as tenacious and as dangerous from the social point of view as vesiculitis, after it has resisted all other measures. *(From Am. Jour. of Phys. Ther., Nov., 1925)*

The Imel Course in Physiotherapy

To Mid-Western physicians and surgeons who are interested in Physiotherapy, Edward S. Imel, M. D., offers a complete one-week course of instruction and discussion. Schedule for the courses is as follows:

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Diathermic Treatment of Malignancies

By GRANT E. WARD, M. D., Baltimore Md.

The essential feature of success in the use of electrodesiccation and electrocoagulation is the development of accurate judgment as to the extent of the disease, and a thorough knowledge of the current being used and the extent of the after-slough with the chosen current. This is attained only by practice.

The technic in itself is quite simple. In large tumors a general anesthetic, such as gas or ether, is preferable. In case ether is used, it must be removed from the room for at least a minute before the current is turned on. If this precaution is observed carefully, there is no danger of explosion, even when working about the head or oral cavity. The hypodermic administration of scopolamin, 1/150 grain, morphin, ¼ grain, and atropin, 1/150 grain, alone or prior to anesthetic, is of great assistance. These drugs may also be used with local or regional anesthetic. In smaller epitheliomas and in benign growths, local injection of a 1 per cent solution of procain is satisfactory.

The older workers used disk or flat metal applicators for the active electrodes, the size to suit that of the lesion to be treated. Doyen employed olivary, cylindric and semi-insulated applicators for work in cavities such as the cervix and rectum. These various forms have been generally discarded, the ordinary needle being adopted for surface treatments, vaginal, cystoscopic, rectal and oral cases being treated with needles of varying lengths and shapes, carrying rubber insulation to within a half inch from the tip. The inactive electrode consists of a large moist pad about 8 by 12 inches, placed under the back or buttocks of the patient. The construction of this pad is simple but important. The wire leading from the electrical machine is attached to a piece of thin sheet copper or heavy wire mesh. The latter is preferable, as it molds to the irregular surfaces of the body more readily. This is essential, for, if any portion of the pad is closer to the skin that another, a spark and consequent skin burn will result. One should remember, therefore, to have the current evenly distributed throughout the inactive electrode, thereby spreading it and avoiding such a burn. The metal parts of the pad are covered with several layers of gauze or, better, asbestos paper, which in turn is covered by linen cloth, the back being insulated from the operating table by sheet rubber. The entire pad is then moistened and placed in a moistened linen pillow case, which can be changed between patients.

Before the needle is applied, the strength and quality of the current are tested on a piece of metal. When the desired quality is obtained, the needle is inserted into the tissue and the current turned on, it being varied a little to meet the needs of the individual case. In treating large areas of disease, one should always begin by throwing a line of coagulation around and beneath them where possible so as to cut off lymph and blood drainage from the part. This is given great emphasis by Clark and Wyeth and is most important. Tissue can now be removed for diagnosis with safety. The entire tumor is next thoroughly coagulated and removed as a mass of dead debris. It is not good technic to carbonize the tissues. This can be avoided by moving the needle from place to place.

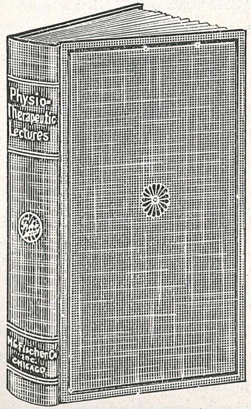
Overtreatment must be continually guarded against, for destruction of tissue goes far beyond the area of white coagulation. With a strong bipolar current, there is coagulation from all sides and point of the needle for from 0.5 to 1 cm.; but in a few days death of the cells beyond this point occurs. This unprecedented deep penetrating effect of electrocoagulation must be borne in mind in treating growth near vital structures or large blood vessels. I have seen, for example, a case of extensive posterior tongue cancer develop a profuse secondary hemorrhage, in spite of a preliminary ligation of the lingual artery.

It is important to emphasize the use of the microscope in checking up the results of the treatment. In case the trouble is not eradicated by the first treatment, a second or third may be carried out with no fear of causing a slowly healing, painful burn in the normal tissue, as in repeated irradiation of skin lesions with the roentgen ray or radium. It is comparatively simple to take a bit of suspicious granulation tissue with some variety of tissue clippers and have a frozen section made, confirming the diagnosis. If disease is present, it then remains to destroy the small areas of active trouble under local anesthesia.

In the case of small and superficial growths, all that is necessary is to insert the needle, turn on the current and, when the disease is white, stop the treatment. With this type of case, healing is assured in from two to four weeks, depending naturally on the size and depth of the lesion. With large cancers, plastic operations are of great help in hastening a good cosmetic result. A great advantage of this method over roentgen ray and radium is seen in the rapidity with which healthy granulations spring up after the slough has been removed, giving a splendid surface for skin grafting. There is none of the slowly healing, indolent ulceration so frequent with radiation therapy.

(*From Journal A. M. A., Feb. 28, 1925*)

The Book of Physiotherapeutic Lectures



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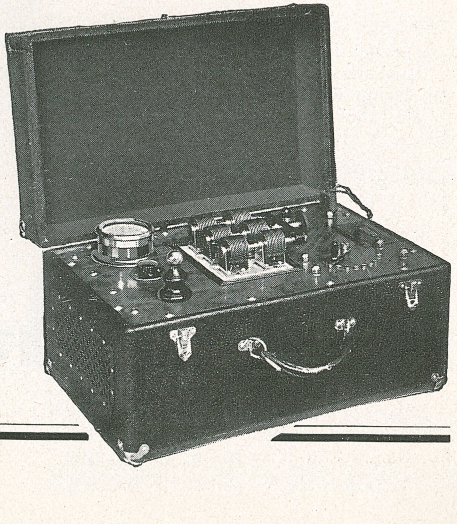


A PAGE OF FUN

She: If wishes came true what would be your first?

He: I would wish—ah, if only I dared tell you.

She: Go on, go on. What do you think I brought up wishing for?—Jack O'Lantern.

□ □ □

Head of the House (in angry tones): Who told you to put that paper on the wall?

Decorator: Your wife, sir.

"Pretty, isn't it?"—The Congregationalist (Boston).

□ □ □

Caller: Your children play so quietly.

Mother: Excuse me a moment.

□ □ □

"I told my wife that if she bobbed her hair I would leave her."

"But she bobbed it; and you're still living with her?"

"You bet I am. I'll show her she can't bluff me."

The child came to his mother in tears.

"Oh, mama," he confessed, "I broke a tile in the hearth."

"Never mind, dear," the mother consoled. "But how ever did you come to do it?"

"I was pounding it with father's watch."—Tit-Bits.

□ □ □

He: When you are in the wrong you never acknowledge it."

She: Yes, I do, but I never am in the wrong."—Ocean Times.

"I saw the doctor you told me to see."

"Did you tell him I sent you?"

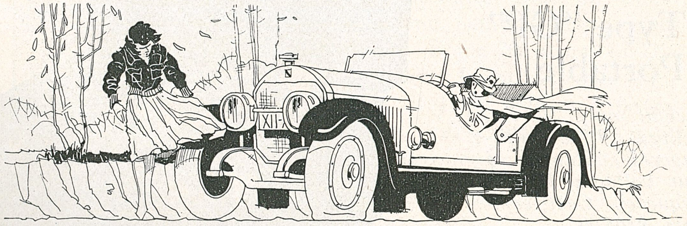
"Yes."

"What did he say?"

"He asked me to pay in advance."—Pearson's.

□ □ □

Something's gone wrong with my right arm, doctor. Yesterday I could lift it as high as this, and now I can't lift it at all.—Magpie.



Driver: "Heavens! I hope we haven't a flat tire."

Passenger (inspecting tire): "I don't think so. It's flat on the bottom, but the rest of it seems to be all right!"

IN THIS WORLD IT IS NOT WHAT WE TAKE UP BUT WHAT WE GIVE UP THAT MAKES US RICH.

—*HENRY WARD BEECHER*